In the Claims

Amendments to the Claims:

1. (currently amended) A method of determining the etch rate and time to etch as a function of the properties of the etching process and of the film being etched, comprising the steps of:

providing a rate formula $ER(C, T)= ER_0*C*exp(-E_a/RT)+ A$;

providing a substrate;

providing an etch bath in a tank;

providing an etch concentration monitor in said tank;

providing a temperature monitor in said tank;

forming a film over said substrate;

measuring the initial thickness of said film over said substrate;

placing said film on said substrate in said tank;

starting the etching of said film in said tank, and simultaneously recording the start time of said etching;

measuring a first temperature of said etch bath in said tank;

measuring a first concentration of said etch bath in said tank;

stopping said etching of said film, and recording the stop time of said etching;

removing said substrate with said film thereon from said tank;

measuring the final thickness of said film on said substrate;

calculating a first film loss by subtracting said initial thickness from said final thickness of said film;

calculating a first etch time by subtracting said start time from said stop time of etching;

calculating a first etch rate ($ER(T, C)_1$) as a function of said first temperature and first concentration;

repeating previous steps at second, third, (n-1) and n temperatures while holding constant said first concentration, and calculating the corresponding second,

third, (n-1) and n^{th} etch rates [$ER(T)_{C2}$, .. $ER(T)_{C(n-1)}$, $ER(T)_{Cn}$] values as a function of said temperatures, and their statistical average ($ER(T)_{C,avg.}$);

repeating previous steps at second, third, (n-1) and n concentration while holding constant said first temperature, and calculating the corresponding second, third, (n-1) and n^{th} etch rates [$ER(C)_{T2}$, .. $ER(C)_{T(n-1)}$, $ER(C)_{Tn}$] values as a function of said concentrations, and their statistical average ($ER(C)_{T,avg.}$);

using said values in said formula to calculate etch rate ER for subsequent etching of said film for a specified film loss or to a specified film thickness;

providing a substrate having formed thereon a first film to be etched and a second film, wherein a first film thickness of said first film is less than a second film thickness of said second film;

calculating a film loss ΔH for said specified film loss or for said specified film thickness; and

calculating etch time;

wherein T is temperature, C is concentration, ER(C, T) is etch rate as a function of concentration (C) and temperature (T), ER_0 is a first constant, E_a is activation energy; R is the universal gas constant, A is a second constant and ΔH is film loss.

2. (canceled)

3. (canceled)

4. (original) The method of claim 1, wherein said initial film thickness is designated as H_A and said final film thickness is designated as H_B.

5. (currently amended) The method of claim 1, wherein said initial film thickness is designated as H_A and said final film thickness is designated as H_B; and. said film loss is $\Delta H=(H_A-H_B)$.

6. (currently amended) The method of claim 1, wherein said etch time (t) is calculated using the formula $t= \Delta H/ER$.

7. (currently amended) A method of determining the etch rate and time to etch as a function of the properties of the etching process and of the film being etched, comprising the steps of:

providing a rate formula $ER(C, T)= ER_0*C*exp(-E_a/RT)+ A$;

rewriting said formula in a simplified form as $ER(C)= K*C + A$;

determining the values of first constant K and second constant A in said formula for said etching solution;

using said values of said first and second constants in said simplified equation to calculate an etch rate;

providing a target film loss or a target film thickness; and

calculating etching time, or "time to etch;"

wherein T is temperature, C is concentration, ER(C, T) is etch rate as a function of concentration (C) and temperature (T), E_a is activation energy; R is the universal gas constant, A is a first constant, K is a second constant, ER_0 is a third constant and ΔH is film loss.

8. (canceled)

9. (canceled)

10. (original) The method of claim 7, wherein said etching time is obtained by dividing said target film loss by said etch rate.

11. (currently amended) A method of determining the etch rate and time to etch as a function of the properties of the etching process and of the film being etched, comprising the steps of:

providing a rate formula $ER(C, T)= ER_0*C*exp(-E_a/RT)+ [A]\underline{D}$;

rewriting said formula in a simplified form as $ER(C)= K*C + [A]\underline{D}$;

determining the values of first constant K and second constant $[A]\underline{D}$ in said formula for said etching solution;

using said values of said first and second constants in said simplified equation to calculate an etch rate;

providing a substrate having formed thereon a first film A to be etched and a second film B, wherein a first film thickness of said first film A is H_A , and a second film thickness of said second film B is H_B;

calculating a film loss ΔH; and

calculating etch time;

wherein T is temperature, C is concentration, ER(C, T) is etch rate as a function of concentration (C) and temperature (T), E_a is activation energy; R is the universal gas constant, D is a first constant, K is a second constant, ER_0 is a third constant and ΔH is film loss.

12. (canceled)

13. (canceled)

14. (original) The method of claim 11, wherein said film loss ΔH is $x - (H_B - H_A)$, wherein said H_B is greater than said H_A, and x is the desired depth height of said film A above said film B after etch.

15. (original) The method of claim 11, wherein said film loss is $\Delta H = (H_A - H_B) - x$, wherein said H_A is greater than said H_B, and x is the desired depth height of said film A above said film B after etch.

16. (original) The method of claim 11, wherein said film loss is $\Delta H = (H_A - H_B)$, wherein before etch, said H_A is greater than said H_B, and after etch, they are of the same height.

17. (original) The method of claim 11, wherein said film loss is $\Delta H = (H_A - H_B) + x$, wherein before etch, said H_A is greater than said H_B, and after etch, said film B is higher than said film A by the step height of x.

18. (currently amended) The method of claim 11, wherein said etch time (t) is calculated using the formula $t = \Delta H/ER$.